

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A device for punching unfired, sheetlike ceramic substrates, in particular so-called green sheets, comprising:

a receiving device, which has a substantially flat receiving face for a ceramic substrate, and in which punched holes are embodied;

at least one die, which is disposed above an associated respective punched hole and has a shaft and an operative portion that extends through a constant diameter stripper opening, which is disposed in a stripper above the associated respective punched hole and extends to an outer face of the stripper facing the receiving face, and that has a diameter that is less than the diameter of the shaft and greater than the diameter of the associated punched hole, and the operative portion, at its lower end, has a punching portion whose diameter is somewhat less than the diameter of the punched hole;

a drive mechanism, which is connected in driving fashion to the die in order to move linearly by a defined stroke and in the process to move the punching portion into the punched hole and out of it; and,

a die guide device, through which the shaft extends and which guides the die at its shaft.

2. (Previously Amended) The punching device of claim 1, wherein the punching portion is unguided in a transverse direction.

3. (Previously Amended) The punching device of claim 1, wherein the die guide device includes a bush with a passage which defines a guide face for the shaft.

4. (Previously Amended) The punching device of claim 1, wherein the stripper opening has a length that exceeds the length of the punching portion.

5. (Previously Amended) The punching device of claim 1, wherein the length of the punching portion is essentially equal to the length of the stroke of the drive mechanism.

6. (Previously Amended) The punching device of claim 1, wherein the length of the operative portion is greater than the stroke of the drive mechanism.

7. (Previously Amended) The punching device of claim 1, wherein the punched hole is a through bore, which opens into a slug conduit which has a greater diameter than the punched hole.

8. (Previously Amended) The punching device of claim 1, wherein the diameter of the shaft is a multiple of the diameter of the operative portion.

9. (Currently Amended) A device for punching sheet-like substrates, comprising:

a receiving device having a substantially flat receiving face for a ceramic substrate, and having a punched hole formed in the flat surface;

a die disposed above the punched hole, said die having a shaft, and an operative portion that extends through and is guided in a constant diameter stripper opening disposed in a stripper above the punched hole and extending to an outer surface of the stripper facing the receiving face, said operative portion including a first part that is guided by a surface defining the stripper opening and has a diameter that is less than the diameter of the shaft and greater than the diameter of the punched hole, and a second punching part that is disposed at a lower end of the first part, and has a diameter that is less than the diameter of the first part and slightly less than the diameter of the punched hole;

a drive mechanism connected in driving fashion to the die to move the die linearly by a defined stroke and in the process move the punching part into and out of the punched hole; and,

a die guide through which the shaft extends and which guides the die shaft.

10. (Previously Presented) The punching device of claim 9, wherein the shaft, and first and second parts of the operative portion of the die are each cylindrical.

11. (Previously Presented) The punching device of claim 9, wherein the punching part is unguided in the transverse direction in the stripper opening.

12. (Previously Presented) The punching device of claim 9, wherein the die guide device includes a bush with a passage that defines a guide surface for the shaft.

13. (Previously Presented) The punching device of claim 9, wherein the stripper opening has a length that exceeds the length of the punching part so that a portion of the first part is always guided within the stripper opening. .

14. (Previously Presented) The punching device of claim 13, wherein the length of the punching part is essentially equal to the length of the stroke of the drive mechanism.

15. (Previously Presented) The punching device of claim 9, wherein the length of the punching part is essentially equal to the length of the stroke of the drive mechanism.

16. (Previously Presented) The punching device of claim 9, wherein the length of the operative portion is greater than the stroke of the drive mechanism.

17. (Previously Presented) The punching device of claim 9, wherein the diameter of the first part is less than the diameter of the stripper opening by a clearance amount.

18. (Currently Amended) A tool for punching sheet-like substrates, comprising:
a lower tool part having a substantially flat receiving face for a substrate, and
having a punched hole formed in the flat surface;

an upper tool part;

a die having a shaft, and a graduated operative portion including a first part having a diameter that is less than the diameter of the shaft and greater than the diameter of the punched hole, and a second punching part disposed at a lower end of the first part and having a diameter that is less than the diameter of the first part and slightly less than the diameter of the punched hole;

a linear die guide disposed in the upper tool part above the punched hole;

a stripper bush mounted on a surface of the upper tool part facing the lower tool part and having a constant diameter stripper opening disposed above the punched hole and extending to an outer surface of the stripper bush facing the receiving surface;

said die being disposed above the punched hole and mounted in the an upper tool part for linear movement toward and away from the lower tool part, with the shaft of the die being disposed in and guided by the linear die guide, and the first part of the operative portion of the die always extending into the stripper opening and being guided by a wall of the stripper bush defining the stripper opening; and,

a drive mechanism connected in driving fashion to the die to move the die linearly by a defined stroke and in the process move the punching part into and out of the punched hole.

19. (Previously Presented) The punching device of claim 18, wherein the shaft, and first and second parts of the operative portion of the die are each cylindrical.

20. (Previously Presented) The punching device of claim 19, wherein the diameter of the first part is less than the diameter of the stripper opening by a clearance amount.